PREFACE

The North Carolina Department of Health, Environment, and Natural Resources' (DEHNR) State Center for Health and Environmental Statistics (SCHES) has been awarded a three-year grant from the Centers for Disease Control (CDC) to design and implement a statewide surveillance system for diabetes. Public health surveillance is defined as "the ongoing and systematic collection and analysis [of population-based datasets]" (1). Surveillance will enable the identification of groups at high risk for diabetes, the appropriate targeting of interventions, and the more accurate measurement of progress in disease prevention and control. The grant will also allow for the dissemination of surveillance results to a wider audience.

While diabetes data are found in several population-based datasets, they are not always analyzed consistently or completely. This grant will allow the SCHES to improve its use of data and systems currently available so that diabetes morbidity and mortality can be better understood.

This mortality report represents the first in a series of diabetes surveillance studies. The results of the following activities will also be detailed in upcoming studies: a statewide telephone survey focusing on diabetes, an analysis of diabetes-related hospitalization, and a description of the blind population afflicted with diabetic eye disease.

INTRODUCTION

In 1989, diabetes mellitus ranked seventh among the leading causes of mortality in North Carolina (Table 1). It was also the state's eighth leading cause of "years of potential life lost," accounting for 176 years of life lost per 100,000 population (Table 2). Based on any mentioned conditions, North Carolina had the 19th highest crude diabetes mortality rate in the United States for the period 1980 through 1986; and after adjustments for age and race, that ranking rose to 16th (Table 3) (1).

Mortality statistics typically underestimate the relationship of diabetes to mortality. They tend to rely exclusively on the underlying cause of death as cited on the death certificate and therefore to identify only those who die from acute symptoms (e.g., those with ketoacidosis or severe vascular problems).

Generally, diabetics do not die from acute symptoms of diabetes. Far more common is a scenario in which the patient suffers from chronic complications that increase the risk of life-threatening heart, kidney, and vascular diseases (2). Should one of these diseases prove fatal, all mention of the diabetes which brought it on may be obscured. Instead, the underlying cause of death is often listed as atherosclerosis, acute myocardial infarction, stroke, nephritis, nephrosis, and so on. Underreporting of this sort is probably most common on the death certificates of geriatric patients suffering from multiple chronic conditions (3).

Given the insidious nature of the disease, establishing accurate mortality statistics can be difficult. One improvement that can be made is to tabulate both the underlying cause of death and the mentioned (i.e., contributory) causes listed on the death certificate. Modifying the evaluative protocol in this fashion allows one to assess the extent to which diabetes serves as a forerunner to various other fatal diseases. Indeed, the data indicate that, throughout the 1980s, diabetes was reported 4.3 times as often as a contributory cause of death than as an underlying cause. Studies that ignore this contributory relationship cannot hope to convey an accurate sense of the disease's impact.

Even with this modification, however, this study's estimates of diabetes-related mortality are probably too low. Several studies have shown that diabetes is listed (anywhere) on the death certificate for only 40 percent of the known diabetics (1); other studies estimate that 40 percent of all diabetics are never even diagnosed (2), while still others conclude that the true diabetes mortality rate is ten times higher than the rate revealed by data on the underlying cause of death (3,4). Nevertheless, trends in adjusted mortality rates are probably reliable indicators of changes in population structure, disease prevalence, and/or disease management, so long as reporting remains consistent over time.

Readers should be aware that an otherwise unexplained increase in diabetes-related mortality could result from an improved awareness of a reporting problem. However, analyses using underlying cause of death data yield very similar results to those obtained using mentioned cause. These results would seem to indicate that corrections based on such an awareness have not yet taken place in North Carolina.